



Operation and Maintenance Manual

428C BACKHOE LOADER

S/N 2CR00001-16211

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Product: BACKHOE LOADER

Model: 428C BACKHOE LOADER 2CR

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Operation and Maintenance Manual

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Foreword

Literature Information

This manual should be stored in the operator's compartment in the literature holder or seat back literature storage area.

This manual contains safety information, operation instructions, transportation information, lubrication information and maintenance information.

Some photographs or illustrations in this publication show details or attachments that can be different from your machine. Guards and covers might have been removed for illustrative purposes.

Continuing improvement and advancement of product design might have caused changes to your machine which are not included in this publication. Read, study and keep this manual with the machine.

Whenever a question arises regarding your machine, or this publication, please consult your Cat dealer for the latest available information.

Safety

The safety section lists basic safety precautions. In addition, this section identifies the text and locations of warning signs and labels used on the machine.

Read and understand the basic precautions listed in the safety section before operating or performing lubrication, maintenance and repair on this machine.

Operation

The operation section is a reference for the new operator and a refresher for the experienced operator. This section includes a discussion of gauges, switches, machine controls, attachment controls, transportation and towing information.

Photographs and illustrations guide the operator through correct procedures of checking, starting, operating and stopping the machine.

Operating techniques outlined in this publication are basic. Skill and techniques develop as the operator gains knowledge of the machine and its capabilities.

Maintenance

The maintenance section is a guide to equipment care. The Maintenance Interval Schedule (MIS) lists the items to be maintained at a specific service interval. Items without specific intervals are listed under the "When Required" service interval. The Maintenance Interval Schedule lists the page number for the step-by-step instructions required to accomplish the scheduled maintenance. Use the Maintenance Interval Schedule as an index or "one safe source" for all maintenance procedures.

Maintenance Intervals

Use the service hour meter to determine servicing intervals. Calendar intervals shown (daily, weekly, monthly, etc.) can be used instead of service hour meter intervals if they provide more convenient servicing schedules and approximate the indicated service hour meter reading. Recommended service should always be performed at the interval that occurs first.

Under extremely severe, dusty or wet operating conditions, more frequent lubrication than is specified in the maintenance intervals chart might be necessary.

Perform service on items at multiples of the original requirement. For example, at every 500 service hours or 3 months, also service those items listed under every 250 service hours or monthly and every 10 service hours or daily.

California Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

Battery posts, terminals and related accessories contain lead and lead compounds. **Wash hands after handling.**

Certified Engine Maintenance

Proper maintenance and repair is essential to keep the engine and machine systems operating correctly. As the heavy duty off-road diesel engine owner, you are responsible for the performance of the required maintenance listed in the Owner Manual, Operation and Maintenance Manual, and Service Manual.

It is prohibited for any person engaged in the business of repairing, servicing, selling, leasing, or trading engines or machines to remove, alter, or render inoperative any emission related device or element of design installed on or in an engine or machine that is in compliance with the regulations (40 CFR Part 89). Certain elements of the machine and engine such as the exhaust system, fuel system, electrical system, intake air system and cooling system may be emission related and should not be altered unless approved by Caterpillar.

Machine Capacity

Additional attachments or modifications may exceed machine design capacity which can adversely affect performance characteristics. Included would be stability and system certifications such as brakes, steering, and rollover protective structures (ROPS). Contact your Cat dealer for further information.

Cat Product Identification Number

Effective First Quarter 2001 the Cat Product Identification Number (PIN) has changed from 8 to 17 characters. In an effort to provide uniform equipment identification, Caterpillar and other construction equipment manufacturers are moving to comply with the latest version of the product identification numbering standard. Non-road machine PINs are defined by ISO 10261. The new PIN format will apply to all Cat machines and generator sets. The PIN plates and frame marking will display the 17 character PIN. The new format will look like the following:

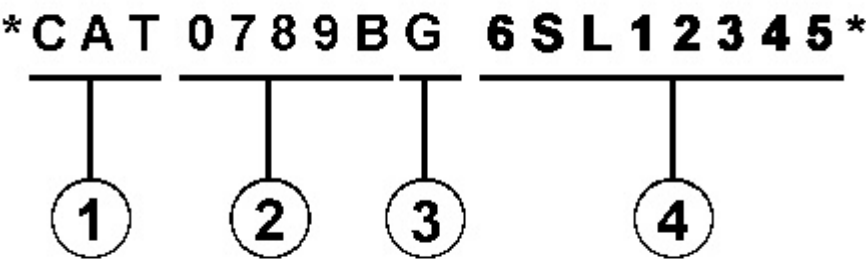


Illustration 1

g00751314

Where:

- 1. Caterpillar's World Manufacturing Code (characters 1-3)
- 2. Machine Descriptor (characters 4-8)
- 3. Check Character (character 9)
- 4. Machine Indicator Section (MIS) or Product Sequence Number (characters 10-17). These were previously referred to as the Serial Number.

This is the sample of the manual

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Machines and generator sets produced before First Quarter 2001 will maintain their 8 character PIN format.

Components such as engines, transmissions, axles, etc. and work tools will continue to use an 8 character Serial Number (S/N).

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Mounting and Dismounting

SMCS - 7000

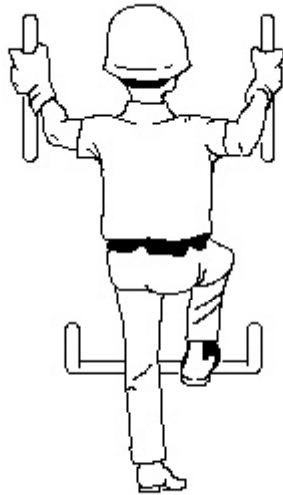


Illustration 1

g00037860

Typical example

Mount the machine and dismount the machine only at locations that have steps and/or handholds. Before you mount the machine, clean the steps and the handholds. Inspect the steps and handholds. Make all necessary repairs.

Face the machine whenever you get on the machine and whenever you get off the machine.

Maintain a three-point contact with the steps and with the handholds.

Note: Three-point contact can be two feet and one hand. Three-point contact can also be one foot and two hands.

Do not mount a moving machine. Do not dismount a moving machine. Never jump off the machine. Do not carry tools or supplies when you try to mount the machine or when you try to dismount the machine. Use a hand line to pull equipment onto the platform. Do not use any controls as handholds when you enter the operator compartment or when you exit the operator compartment.

Machine Access System Specifications

The machine access system has been designed to meet the intent of the technical requirements in "ISO 2867 Earth-moving Machinery – Access Systems". The access system provides for operator access to the operator station and to conduct the maintenance procedures described in Maintenance section.

Alternate Exit

Machines that are equipped with cabs have alternate exits. For additional information, see Operation and Maintenance Manual, "Alternate Exit".

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Daily Inspection

SMCS - 7000

NOTICE

Accumulated grease and oil on a machine is a fire hazard. Remove this debris with steam cleaning or high pressure water, at least every 1000 hours or each time any significant quantity of oil is spilled on a machine.

Note: For maximum service life of the machine, make a thorough walk-around inspection before you operate the machine. Inspect the machine for leaks. Remove any debris from the engine compartment and the undercarriage. Remove any debris from the stabilizers and all working cylinders in order to prevent damage to the machine. Ensure that all guards, covers, and caps are secured. Inspect all hoses and belts for damage. Make the needed repairs before you operate the machine.

Perform the following procedures on a daily basis.

- Operation and Maintenance Manual, "Backhoe Boom, Stick, Bucket, and Cylinder Bearings - Lubricate"
- Operation and Maintenance Manual, "Backup Alarm - Test"
- Operation and Maintenance Manual, "Brake Reservoir Oil Level - Check"
- Operation and Maintenance Manual, "Braking System - Test"
- Operation and Maintenance Manual, "Cooling System Level - Check"

- Operation and Maintenance Manual, "Engine Air Filter Service Indicator - Inspect"
- Operation and Maintenance Manual, "Engine Oil Level - Check"
- Operation and Maintenance Manual, "Fuel System Water Separator - Drain"
- Operation and Maintenance Manual, "Hydraulic System Oil Level - Check"
- Operation and Maintenance Manual, "Loader Bucket, Cylinder, and Linkage Bearings - Lubricate"
- Operation and Maintenance Manual, "Seat Belt - Inspect"
- Operation and Maintenance Manual, "Stabilizer - Clean/Inspect"
- Operation and Maintenance Manual, "Stabilizer and Cylinder Bearings - Lubricate"
- Operation and Maintenance Manual, "Swing Frame and Cylinder Bearings - Lubricate"
- Operation and Maintenance Manual, "Tire Inflation - Check"
- Operation and Maintenance Manual, "Transmission Oil Level - Check"

Refer to the Maintenance Section for the detailed procedures. Refer to the Maintenance Interval Schedule for a complete list of scheduled maintenance.

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Alternate Exit

SMCS - 7310



Illustration 1

g00287239

The cab door on the right side of the machine serves as an alternate exit. The cab door can be opened from the inside or from the outside. Pull the door latch on the outside of the cab door in order to open the cab door from the outside.



Illustration 2

g00287240

Move the lever on the inside of cab door in order to unlatch the cab door and open the cab door from the inside.

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Seat

SMCS - 7312

Adjust the seat at the beginning of each work period and adjust the seat when you change operators.

Lock the seat into position before you operate the machine. This will prevent movement of the seat.

Always use the seat belt when you operate the machine.

The seat should be adjusted so that full pedal travel is allowed while the operator is seated against the back of the seat.

Seat

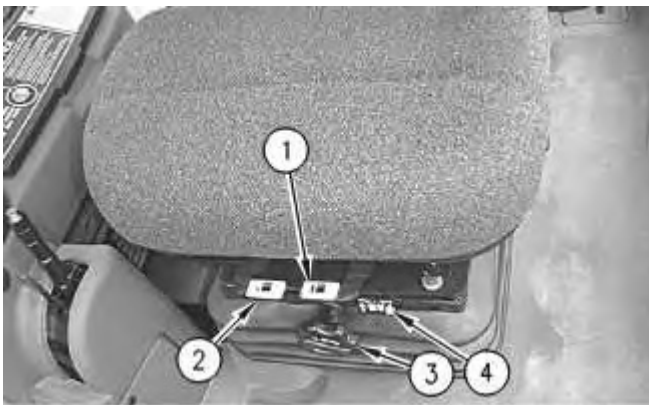


Illustration 1

g00292486

Pull up on the fore/aft lever (1). Hold up the lever and slide the seat forward or backward to the desired position. Release the lever in order to lock the seat into position.

Pull up on the rotate lever (2). The seat will rotate to the rear of the machine in order to operate the backhoe.

Turn the knob (3) clockwise in order to increase the stiffness of the suspension or turn the knob counterclockwise in order to decrease the stiffness of the suspension. Use the indicator (4) for the approximate weight setting. Do not turn the knob past the maximum or minimum weight setting.



Illustration 2

g00293565

Pull up on the seat cushion (5) in order to adjust the height of the seat.

Push down on the back cushion angle lever (6) in order to adjust the angle of the back cushion. Release the lever in order to lock the back cushion into position.

Additional adjustments can be made to the seat by loosening the bolts located on the side of the seat. Slide the seat forward or backward to the desired position and tighten the bolts.

Air Seat



Illustration 3

g00509551

Push down on the back cushion angle lever (1) in order to adjust the angle of the back cushion. Release the lever in order to lock the back cushion into position.

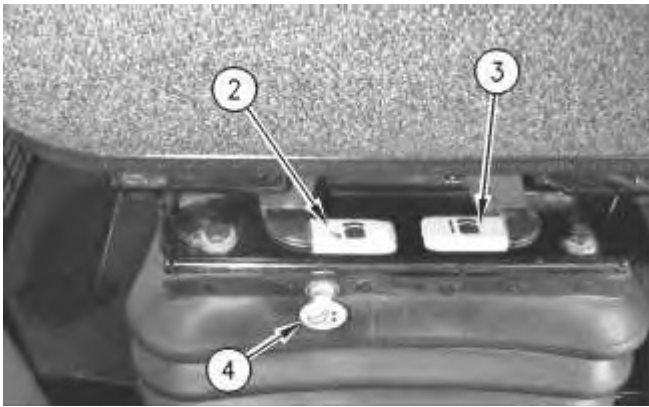


Illustration 4

g00509373

Pull up on the fore/aft lever (3). Hold up the lever and slide the seat forward or backward to the desired position. Release the lever in order to lock the seat into position.

Pull up on the rotate lever (2). The seat will rotate to the rear of the machine in order to operate the backhoe.

Push in the knob (4) in order to increase the stiffness of the suspension. Pull the knob in order to decrease the stiffness of the suspension.

Note: The engine start switch key must be in the ON position in order to increase the stiffness of the seat.

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Seat Belt

SMCS - 7327

Note: This machine was equipped with a seat belt when the machine was shipped from Caterpillar. At the time of installation, the seat belt and the instructions for installation of the seat belt meet the SAE J386 and ISO 6683 standards. Consult your Cat dealer for all replacement parts.

Always check the condition of the seat belt and the condition of the mounting hardware before you operate the machine.

Seat Belt Adjustment for Non-Retractable Seat Belts

Adjust both ends of the seat belt. The seat belt should be snug but comfortable.

Lengthening the Seat Belt

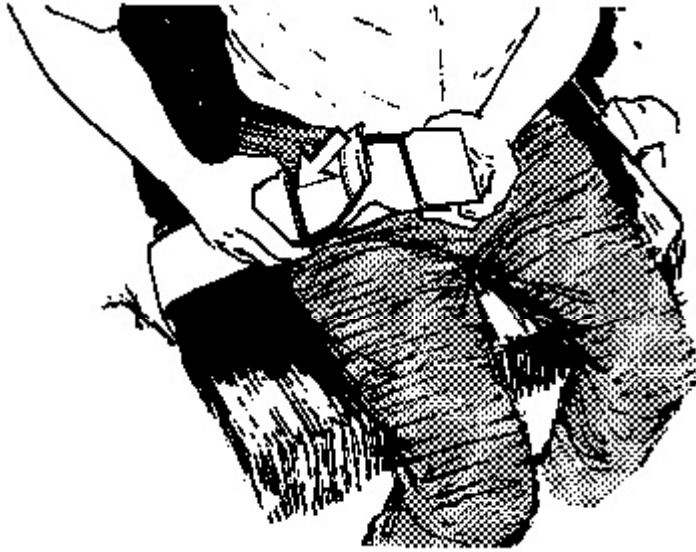


Illustration 1

g00100709

1. Unfasten the seat belt.

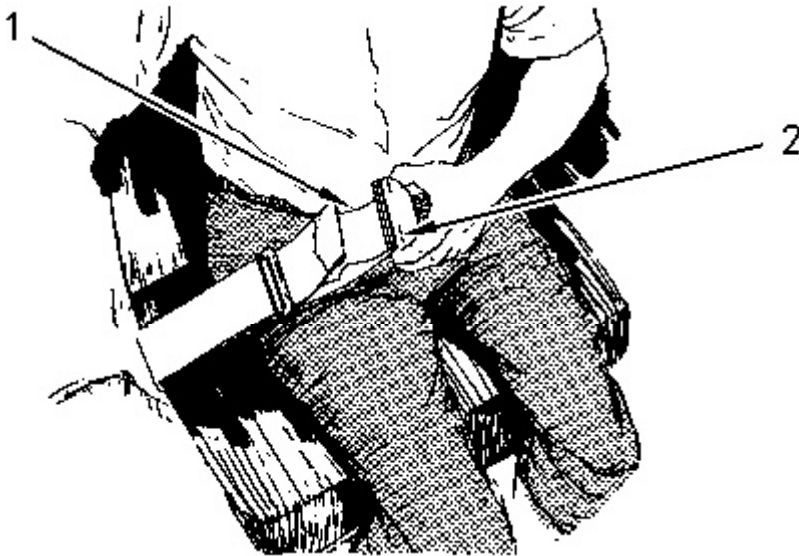


Illustration 2

g00932817

2. To remove the slack in outer loop (1) , rotate buckle (2) . This will free the lock bar. This permits the seat belt to move through the buckle.
3. Remove the slack from the outer belt loop by pulling on the buckle.

4. Loosen the other half of the seat belt in the same manner. If the seat belt does not fit snugly with the buckle in the center, readjust the seat belt.

Shortening the Seat Belt

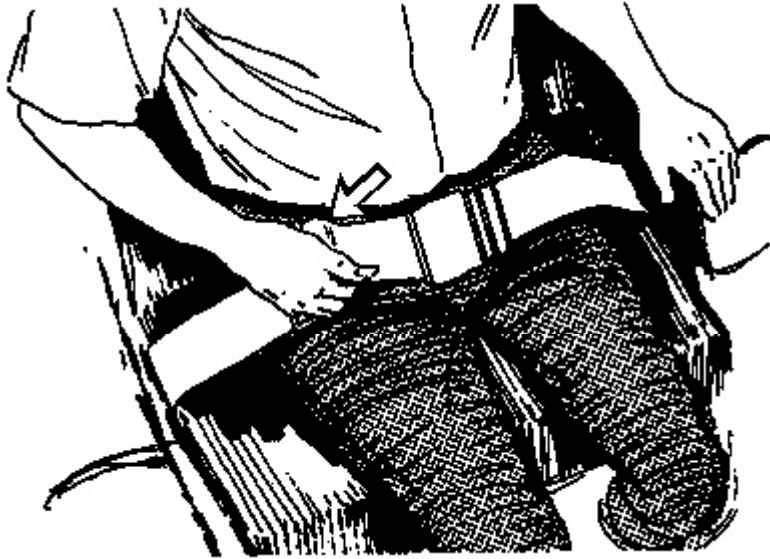


Illustration 3

g00100713

1. Fasten the seat belt. Pull out on the outer belt loop in order to tighten the seat belt.
2. Adjust the other half of the seat belt in the same manner.
3. If the seat belt does not fit snugly with the buckle in the center, readjust the seat belt.

Fastening The Seat Belt

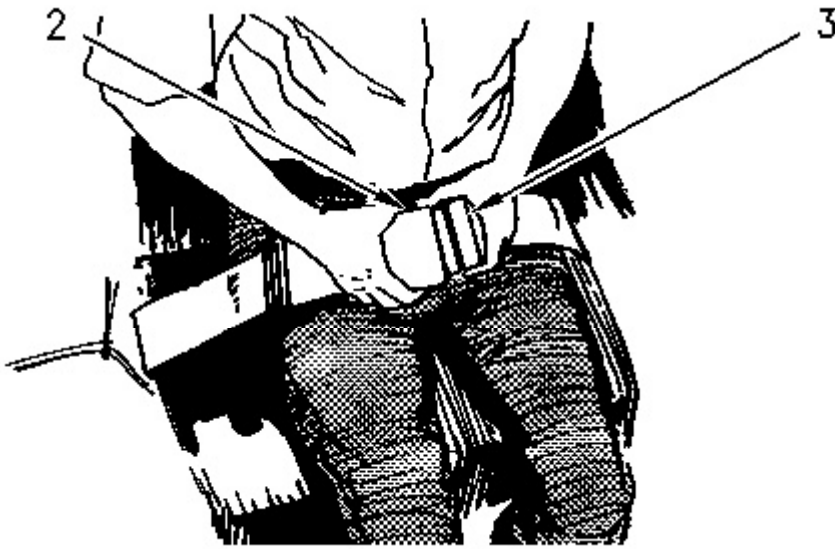


Illustration 4

g00932818

Fasten the seat belt catch (3) into the buckle (2) . Make sure that the seat belt is placed low across the lap of the operator.

Releasing The Seat Belt

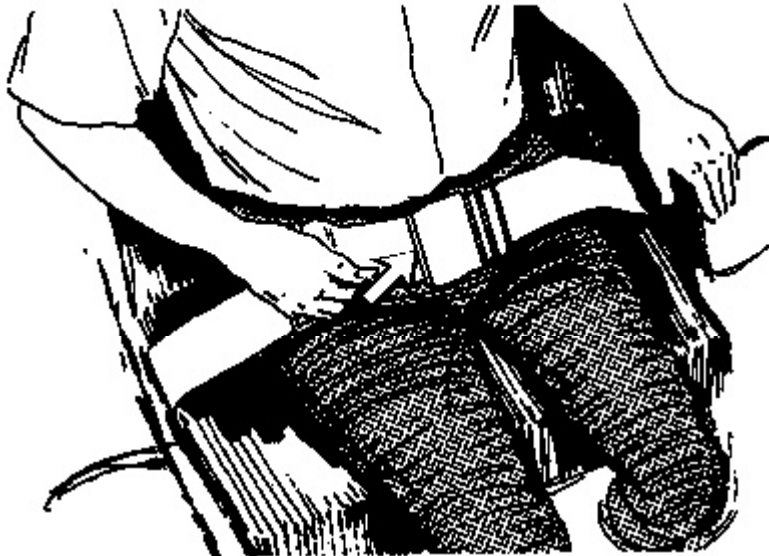


Illustration 5

g00100717

Pull up on the release lever. This will release the seat belt.

Seat Belt Adjustment for Retractable Seat Belts

Fastening The Seat Belt

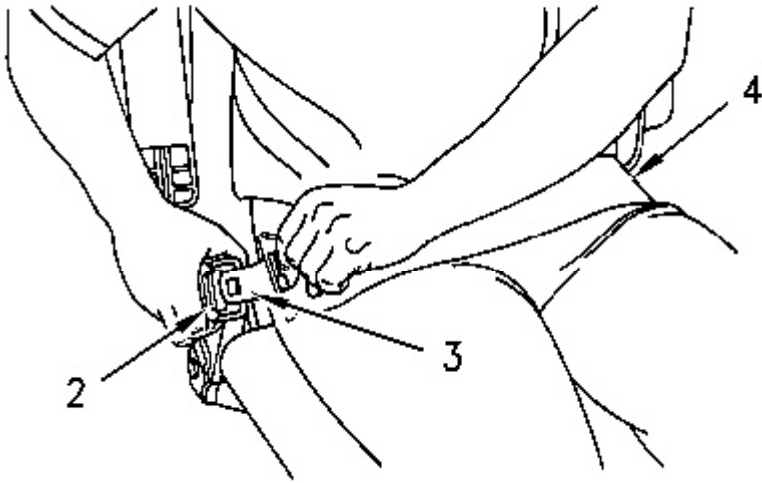


Illustration 6

g00867598

Pull seat belt (4) out of the retractor in a continuous motion.

Fasten seat belt catch (3) into buckle (2) . Make sure that the seat belt is placed low across the lap of the operator.

The retractor will adjust the belt length and the retractor will lock in place. The comfort ride sleeve will allow the operator to have limited movement.

Releasing The Seat Belt

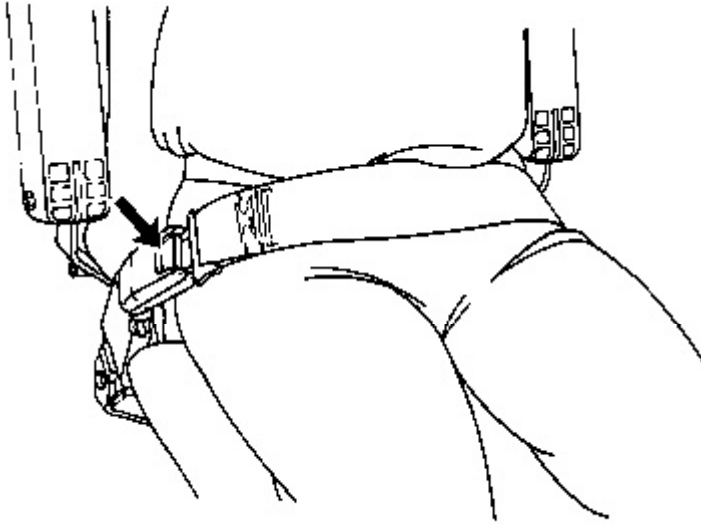


Illustration 7

g00039113

Push the release button on the buckle in order to release the seat belt. The seat belt will automatically retract into the retractor.

Extension of the Seat Belt



WARNING

When using retractable seat belts, do not use seat belt extensions, or personal injury or death can result.

The retractor system may or may not lock up depending on the length of the extension and the size of the person. If the retractor does not lock up, the seat belt will not retain the person.

Longer, non-retractable seat belts and extensions for the non-retractable seat belts are available.

Caterpillar requires only non-retractable seat belts to be used with a seat belt extension.

Consult your Cat dealer for longer seat belts and for information on extending the seat belts.

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Backup Alarm

SMCS - 7406



Illustration 1

g00287250

Backup Alarm - The alarm will sound when the transmission direction control lever is in the REVERSE position. The alarm is used to alert people behind the machine that the machine is backing up.

The backup alarm is mounted on the rear of the machine.



Service Information System

Shutdown SIS

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Alert Indicators

SMCS - 7450; 7451

S/N - 1CR1-UP

S/N - 1ER1-899

S/N - 1FR1-UP

S/N - 1JR1-1149

S/N - 1MR1-UP

S/N - 1NR1-1049

S/N - 1PR1-UP

S/N - 1RR1-1099

S/N - 1TR1-1849

S/N - 1WR1-UP

S/N - 1XR1-2249

S/N - 1YR1-UP

S/N - 1ZR1-999

S/N - 2AR1-UP

S/N - 2BR1-999

S/N - 2CR1-19309

S/N - 2DR1-3449

S/N - 4ZN1-UP

S/N - 5YN1-16589

S/N - 6XN1-UP

S/N - 7WN1-1099

S/N - 8RN1-4989

S/N - 8TN1-UP

S/N - 9JN1-1049

S/N - 9KN1-1399



Illustration 1

g00293025

Type I Console

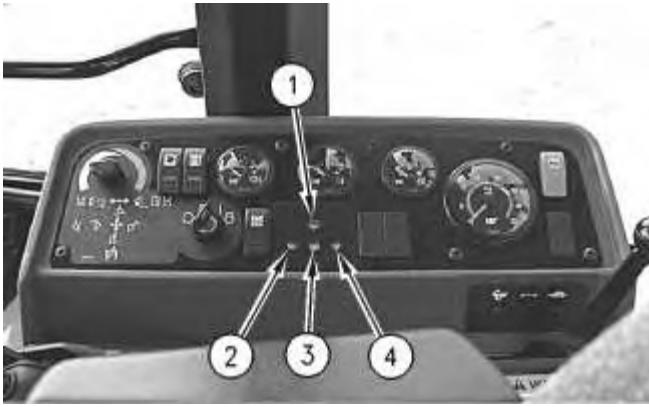


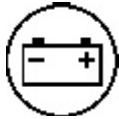
Illustration 2

g00290210

Type II Console



Charging System (1) - This alert indicator appears on the Type I console. The alert indicator comes on if there is a malfunction in the electrical system. If this alert indicator comes on, the system voltage is too high for normal machine operation or too low for normal machine operation.



Charging System (1) - This alert indicator appears on the Type II console. The alert indicator comes on if there is a malfunction in the electrical system. If this alert indicator comes on, the system voltage is too high for normal machine operation or too low for normal machine operation.

If electrical loads (air conditioning and/or lighting) are high and the engine speed is near idle, increase the engine speed to high idle. This will generate more output from the alternator. If the alert indicator for the electrical system turns off within one minute, the electrical system is probably operating in a normal manner. However, the electrical system may be overloaded during periods of low engine speeds.

Modify the operating cycle in order to prevent overloading the electrical system and discharging the batteries.

Low idle must be set correctly. Adjust for the high side of the Low Idle specification while the most often used electrical loads are turned on. In order to reduce the loads, use the Medium fan speed instead of the High fan speed.

If this procedure does not cause the alert indicator to turn off, move to a convenient location. Investigate the cause (loose alternator belt, broken alternator belt, defective batteries, etc).

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